VIEWVAC VACUUM VIEWING PORTS

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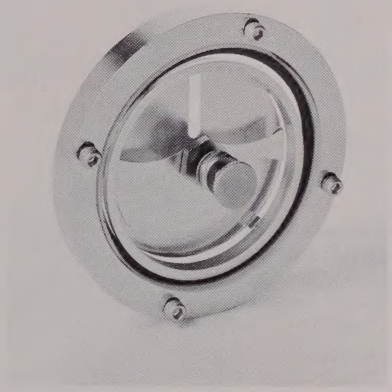
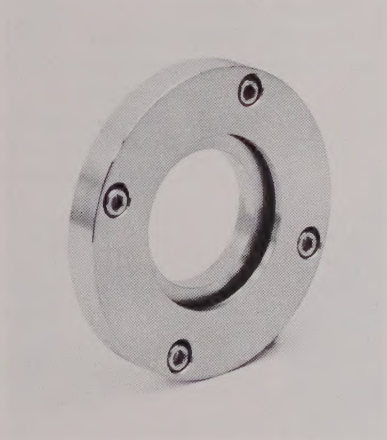
0101-8771-1

Instruction Manual





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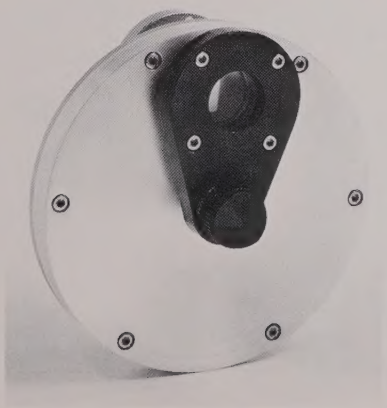


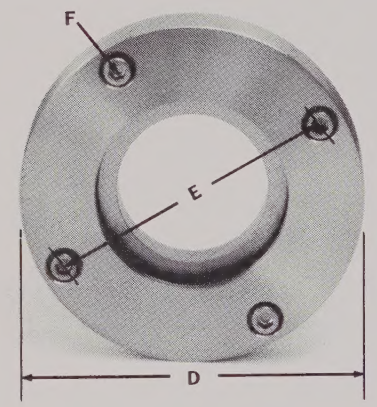
AIRCO Temescal

FULL FIELD VIEWING PORTS - Models VV-220, VV-420, and VV-620

These full field viewports consist of a replaceable glass disc mounted on a stainless steel flange. They have no moving parts.

SPECIFICATIONS

Field of View	Full Field
Construction	No. 304 stainless steel mounting flange; Pyrex® glass viewing window; Viton® O-ring seal
Vacuum integrity	10^{-9} torr range
Bake-out temperature	437°F (225°C)



DIMENSIONS (inches)

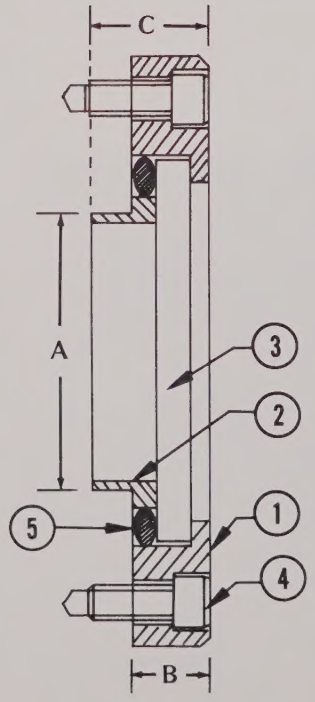
	VV-220	VV-420	VV-620
A	2.00	4.00	6.25
B	0.50	0.75	1.25
C	0.84	0.96	1.53
D (diam.)[1]	4.25	6.00	8.38
E (diam.)	3.63	5.50	7.88
F	(4)1/4-20 NC-2 A	(4)1/4-20 NC-2 A	(4)1/4-20 NC-2 A
G (O-ring)[2]	2.38 x 0.19	4.25 x 0.19	6.50 x 0.19

[1] *Bolt Circle*
[2] *I.D. x Cross-Section*

MOUNTING DIMENSIONS (inches)

(Mounting surface should be spot-faced to a no. 32 finish or better.)

	VV220	VV420	VV660
Spot face, minimum diam.	4.313	6.000	8.500
Through hole	2.000	4.031	6.281
Bolt hole depth	.375	.375	.313



PARTS LIST

VV-220

ITEM NO.	PART NO.	DESCRIPTION	MTRL.	QTY.
1	0502-3472-0	Viewport flange	SST	1
2	0502-3482-0	Viewport sleeve	SST	1
3	0203-0902-0	1/4" x 2-3/4" diam. glass	7740 Pyrex	1
4	1321-1856-0	Soc. hd. cap scr. 1/4-20 x 5/8"	SST	4
5	2231-0332-1	O-ring no. 2-332 2.35" I.D. x 3/16" C.S.	Viton	1

VV-420

ITEM NO.	PART NO.	DESCRIPTION	MTRL.	QTY.
1	0418-2052-1	Viewport flange	SST	1
2	0418-2061-1	Viewport sleeve	SST	1
3	9031-2673-4	1/2 x 4-3/4" diam glass	7740 Pyrex	1
4	1221-1857-0	Soc. hd. cap scr. 1/4-20 x 3/4"	Cad. Pl. Stl.	4
5	2231-0347-1	O-ring no. 2-347 4-1/4 I.D. x 3/16 C.S.	Viton	1

VV-620

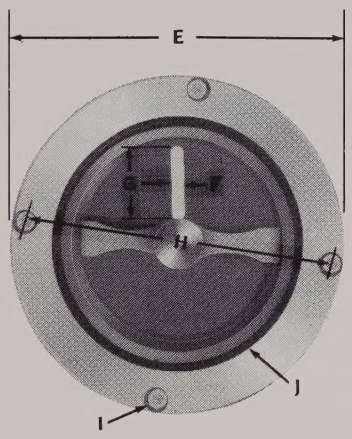
ITEM NO.	PART NO.	DESCRIPTION	MTRL.	QTY.
1	0302-8303-0	Viewport flange	SST	1
2	0302-8292-0	Viewport sleeve		1
3	9031-3081-0	3/4 x 6-31/32" diam. glass	7740 Pyrex	1
4	1221-1859-0	Soc. hd. cap scr. 1/4-20 x 1"	Cad. Pl. Stl.	4
5	2231-0363-0	O-ring no. 2-363 6-1/2" I.D. x 3/16" C.S.	Viton	1

ROTATING VIEW PORTS - Model VV-410

These viewing ports are designed for systems which generate considerable amounts of evaporant. They consist of an outer, thick Pyrex glass window and an inner, rotatable condensing glass disc mounted in front of a viewing slit. The position of the slit can be adjusted for optimum viewing angle. When the condensing glass directly in front of the viewing slit becomes coated with evaporant, it can be rotated slightly to a clear section. By returning the coated section of the glass to the slit when the port is not in use, the viewing life of the port can be greatly extended. When the inner glass is completely coated, it is easily removed for cleaning or replacement.

SPECIFICATIONS

Field of View, VV-410	95°
Construction	No. 304 stainless steel on all surfaces exposed to vacuum Pyrex glass outer disc Viton o-ring seal
Vacuum integrity	10^{-8} torr range
Bake-out temperature	437°F (225°C)



DIMENSIONS (inches)

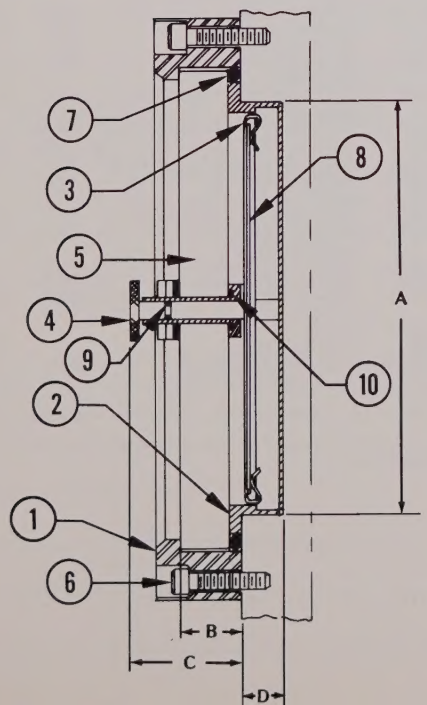
	VV-410
A (diam.)	4.00
B	0.75
C	1.13
D	0.19
E (diam.)	6.00
F	0.25
G	1.38
H (diam.)[1]	5.50
I	(4) 1/4-20 NC-2 A
J (O-ring)[2]	4.50 x 0.19

[1] *Bolt Circle*
[2] *I.D. x Cross-Section*

MOUNTING DIMENSIONS (inches)

(Mounting surface should be spot-faced to a number 32 finish or better.)

	VV-410
Spot face minimum diam.	6.000
Through hole	4.031
Bolt hole depth	.375



PARTS LIST

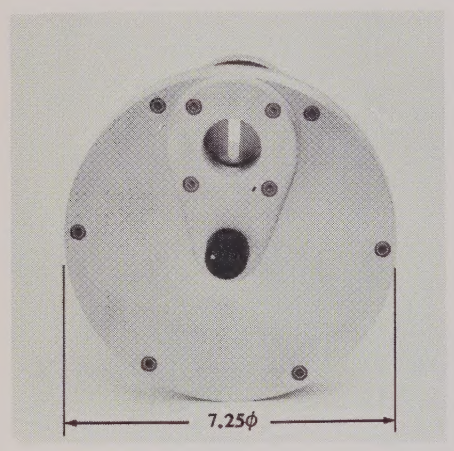
VV-410

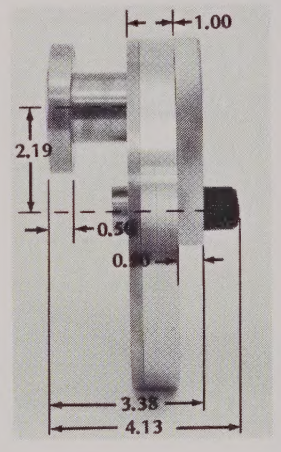
ITEM NO.	PART NO.	DESCRIPTION	MTRL.	QTY
1	0418-2052-0	Window clamp 4"	SST	1
2	0415-0682-0	Slit shield assembly		1
3	0418-2561-0	Spider		1
4	0318-4182-0	Rotating window stem assy.		1
5	0802-8391-0	Window glass		1
6	1321-1856-0	Soc. hd. cap scr. 1/4-20 x 5/8"	SST	4
7	2231-0347-1	O-ring no. 2-347 4 1/4" ID x 3/16" C.S.	Viton	1
8	9031-1369-0	3 5/8" x 1/16" glass	Glass	1
9	2231-0007-1	O-ring 5/32 i.d. x 1/16 w	Viton	1
10	2231-0110-1	O-ring 3/8 i.d. x 3/32 w	Viton	1

MAGNETICALLY ROTATED VIEWING PORT - Model VV-165

This viewport is designed for systems which generate considerable amounts of evaporant. It consists of an outer, thick Pyrex glass window and an inner condensing glass which is magnetically rotated, thus eliminating rotating seals and permitting a vacuum integrity in the 10^{-9} torr range. The condensing glass is mounted in front of a viewing slit. The position of the slit can be adjusted for optimum viewing angle. When the condensing glass directly in front of the viewing slit becomes coated with evaporant, it can be rotated slightly to a clear section. By returning the coated section of the glass to the slit when the port is not in use, the viewing life of the port can be greatly extended. When the inner glass is completely coated, it is easily removed for cleaning or replacement.

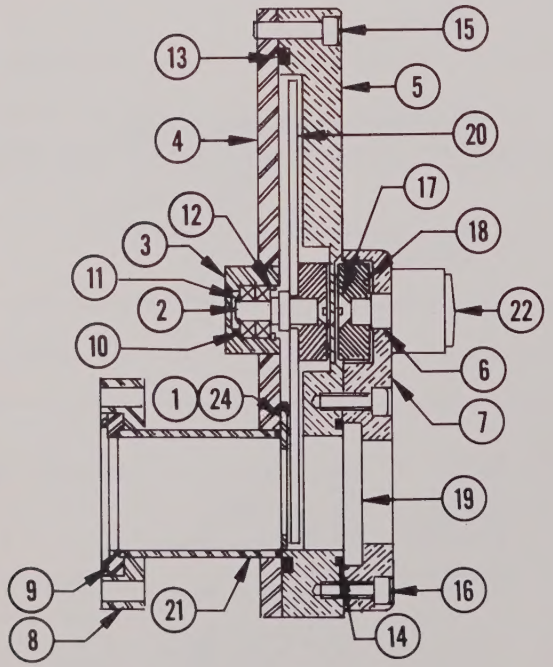
Dimensions in inches





SPECIFICATIONS

Field of View	45°
Construction	No. 304 stainless steel on all surfaces exposed to vacuum Pyrex glass outer disc Viton O-ring seal
Vacuum integrity	10^{-9} torr range
Bake-out temperature	437°F (225°C)
Mounting	1.5" ID, 2.75"OD metal sealed flange



PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	MTRL.	QTY.
1	0303-1481-0	Orifice Plate	SST	1
2	0303-1491-0	Driven Shaft		1
3	0303-1501-0	Bearing Housing		1
4	0303-1522-0	Base Plate		1
5	0303-1532-0	Cover Plate		1
6	0303-1511-0	Drive Shaft		1
7	0303-1542-0	Magnet & Glass holder		1
8	0202-5223-0	Flange 1-1/2"	SST	1
9	0202-5233-0	Insert 1-1/2"	SST	1
10	9120-1400-5	Barden, SR4SSTB	SST	2
11	1384-1025-0	Retaining Ring Truarc 5100-25	SST	1
12	1384-0062-0	Retaining Ring Truarc 5000-62	SST	1
13	2231-0257-1	O-ring 5-7/8" I.D. x 1/8" C.S.	Viton	1
14	2231-0029-1	O-ring 1-1/2" I.D. x 1/16" C.S.	Viton	1
15	1321-1757-0	Soc. Hd. cap scr. 10-32 x 3/4"	SST	6
16	1321-1756-0	Soc. hd. cap screw 10-32 x 5/8"	SST	4
17	1341-1754-0	Flat hd. screw 10-32 x 3/8"	SST	2
18	9004-0095-0	Magnet, Arnold no. 5E95 (6 pole rotor)	Alnico	2
19	9031-1883-0	Glass 1-3/4" diam. x 3/16" thk.	Pyrex	1
20	9031-1377-1	Glass 5-1/2" diam. x 1/16" thk.	Pyrex	1
21	5470-1506-5	Tube 1-1/2" O.D. x .065"W x 1-7/8"	SST	1
22	6047-6575-0	Knob		1
23	303-1552	*Holding tool		1
24	1341-0851-0	Flat hd. mach. screw no. 4-40 x 3/16" lg.	SST	2

*The holding tool (not shown) is used to hold the driven shaft while tightening the flat head screw.

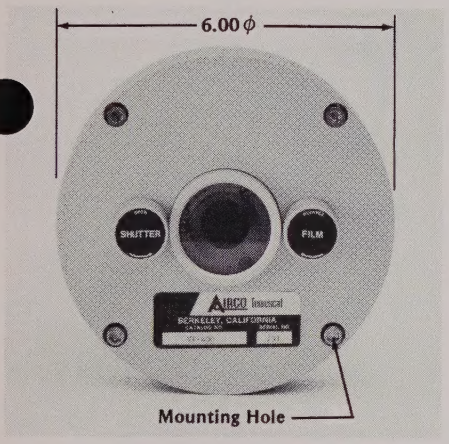
POLARIZED WINDOW VIEWING PORT - Model VV-400

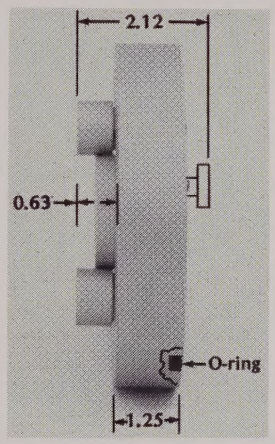
This viewport is designed for systems which generate considerable amounts of evaporant, or systems in which direct viewing of bright objects is desired.

A clear, low vapor pressure Teflon film is interposed between the evaporant source and the viewing window. As the film is coated and becomes opaque, it is advanced to expose fresh film. The unit is equipped with a shutter which allows conservation of the film during periods when viewing is not necessary. The 60 feet of film provided allows approximately 4000 full-aperture exposures. With careful use, as many as 10,000 exposures can be expected. When the film supply is nearly exhausted, an indicator wire appears at the edge of the window.

The Model VV-400 is equipped with a set of polarized filters which allow direct viewing of bright objects. The opacity of the filters varied by rotating the outer window housing.

Dimensions in inches





SPECIFICATIONS	
Field of View	90°
Construction	No. 416 stainless steel shaft No. 304 stainless steel on all other surfaces exposed to vacuum Viton O-ring seal
Vacuum integrity	10^{-8} torr range
Bake-out temperature	212°F (100°C)

MOUNTING DIMENSIONS (inches) (Mounting surface should be spot-faced to a number 32 finish or better.)	
Spot face to a no. 32 finish	6.250
Through hole	4.000
Bolt circle	5.500
Bolts	1/4 - 20
Bolt hole	.375

REPLACEMENT FILM

Two types of film are available for use in the VV-440:

KAPTON is used primarily in high temperature applications where the viewing port is mounted close to the heat source or is subjected to extremely high evaporation rate situations. KAPTON is supplied in 1 1/2" diameter spools containing 120 feet of 0.001 inch thick film (part number 0502-3701-1).

TEFLON is a clear film which is well suited for use at pressures down to 10^{-9} torr. It is recommended for small systems with limited pumping capacity, as well as systems which are frequently vented to atmosphere. TEFLON is supplied in 1 1/2" diameter spools containing 60 feet of 0.002 inch thick film (part number 0502-3701-2).

MAINTENANCE

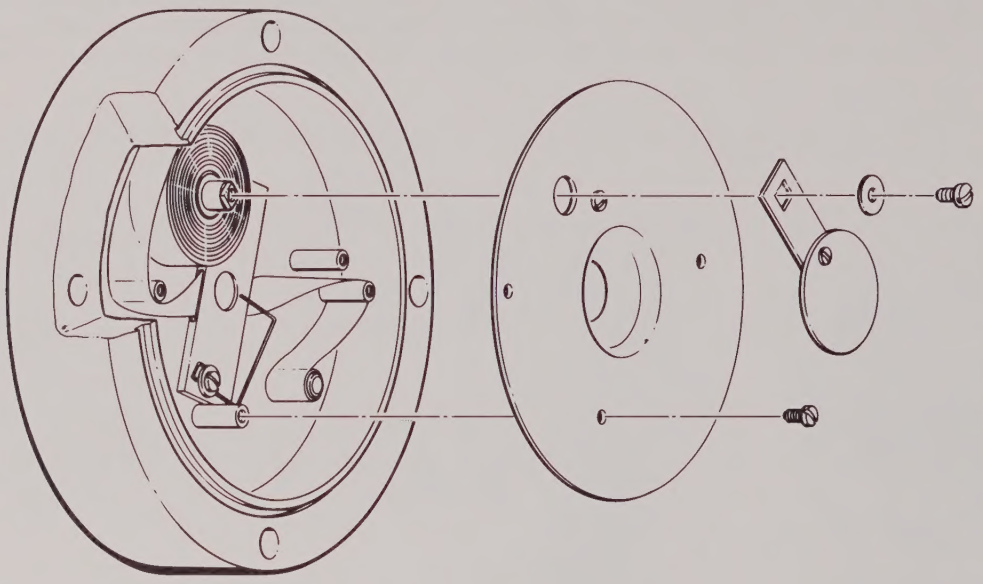
Maintenance on the VV-400 consists of installing new film and periodically relubricating the rotating seals. (Rotating seal leakage is usually due to inadequate lubrication.) Although these two procedures are described separately, it is recommended that the operator inspect the seals each time he changes film.

INSTALLING NEW FILM

1. Remove the unit from the vacuum system.
2. Remove the shutter arm screw and the shutter.
3. Remove the three vapor shield screws and the vapor shield.

4. Remove the exposed film.

5. Install a new spool of film according to the diagram below. Thread the film through the film guide and secure it to the take-up shaft with the tape on the fresh film. Be sure that the film is exactly perpendicular to the take-up shaft by rotating the shaft several times, making sure the film is not climbing up the shaft.



6. Adjust the indicator wire if it was disturbed. It can be adjusted to reach the center of the field of view when the film supply is nearly exhausted.

7. Reassemble in reverse order. The shutter may be adjusted to provide optimum shielding.

LUBRICATING THE ROTATING SHAFT SEALS

1. Complete steps (1) through (4) above.

2. Remove the film supply knob.

3. Clean and inspect the shaft and bushing for burrs and scratches. If damage is found in the seal area, polish the shaft with 600 grit paper lubricated with kerosene. Polish lines must be concentric with the shaft.

4. Very carefully wipe the "Quad" ring and inspect it for damage. If it is damaged, replace it. ("Quad" ring No. 4010, compound 366Y, manufactured by the Minnesota Rubber Company.)

5. Apply a liberal amount of vacuum grease to the inner and outer surfaces of the seal and install the seal in the bushing.

6. Lightly grease the shaft with vacuum grease.

7. While holding the seal retaining washer directly over the seal, insert the shaft. This will prevent pushing out the seal.

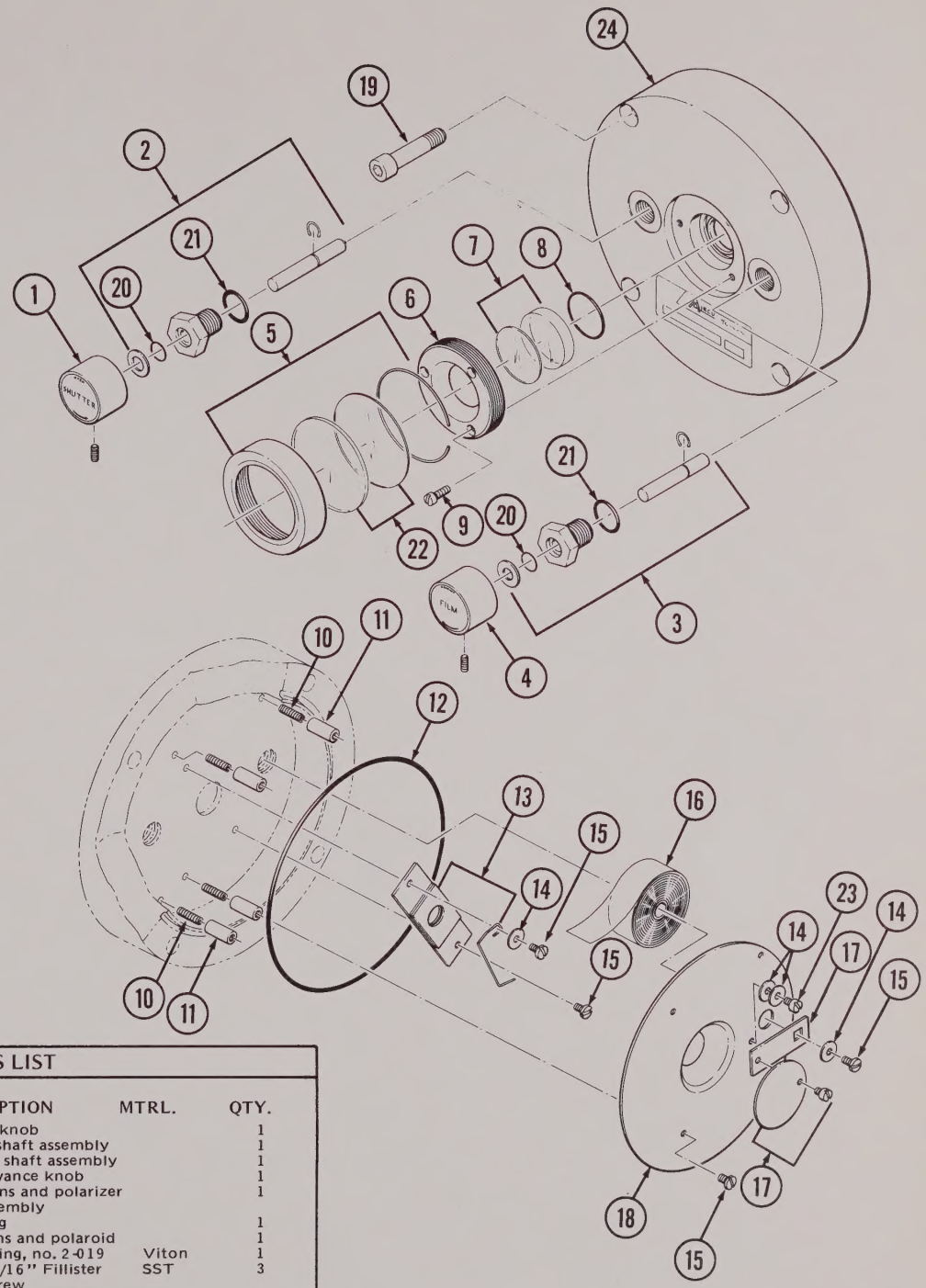
8. Install the knob, allowing a few mils clearance between the knob and fiber washer to insure free shaft rotation.

9. Repeat the above steps for the shutter seal.

10. Reassemble in reverse order.

VV400 FRONT VIEW

VV400 BACK VIEW



PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	MTRL.	QTY.
1	0802-7531-4	Shutter knob		1
2	0802-7531-7	Supply shaft assembly		1
3	0802-7531-3	Take-up shaft assembly		1
4	0802-7531-5	Film advance knob		1
5	0802-7531-1	Outer lens and polarizer ring assembly		1
6		Lens ring		1
7	0802-7531-8	Inner lens and polaroid		1
8	2231-0019-0	Lens o-ring, no. 2-019	Viton	1
9		6-23 x 5/16" Fillister head screw	SST	3
10	1311-1255-0	6-32 x 1/2" socket head set screw	SST	4
11		Stand-off, VV400-19		4
12	2231-0248-1	Body o-ring, no. 2-248	Viton	1
13	0802-7531-2	Film guide and supply indicator		1
14		Washer, no. 6	SSTQ	4
15		6-32 x 1/4" pan head screw	SST	4
16	0502-3701-1	Film spool	Kapton	1
	0502-3701-2	Film spool	Teflon	1
17	0802-7531-6	Shutter and arm assy.		1
18	0802-7531-0	Heat shield		1
19	1321-1860-0	1/4-20 x 1-1/4" hex head cap screw		4
20		Shaft, seal, Minnesota Rubber Co. no. 4010	Compound 366Y	1
21	2231-0111-1	Bushing o-ring, no.2-111	Viton	1
22	0802-7531-9	Outer lens and polaroid		1
23		6-32 x 1/8" pan head	SST	1
24		Body		

WARRANTY

MECHANICAL WARRANTY: For a period of twelve (12) months from the date of original shipment to Purchaser thereof, the apparatus and each part or component manufactured by the Airco Temescal Division of Airco, Inc. ("Airco") is warranted to be free from functional defects in materials and workmanship. The foregoing warranty is subject to the condition that the apparatus, part or component be properly operated under conditions of normal use and that regular periodic maintenance and service be performed or replacements made in accordance with instructions provided by Airco. The foregoing warranty shall not apply to any apparatus, part or component that has been repaired other than by Airco or an authorized Airco representative or in accordance with written instructions provided by Airco, that has been altered by anyone other than Airco or that has been subject to improper installation or abuse, misuse, negligence, accident or corrosion.

Purchaser's sole and exclusive remedy under the above warranty is limited to, at Airco's option, repair or replacement of defective parts or components or return to Purchaser of the price of the apparatus. Any such obligation on Airco's part is subject to the following requirements: (x) the defect must be promptly reported to Airco; (y) if so advised by Airco, Purchaser must return the part or component with a statement of the observed deficiency not later than seven (7) days after the expiration date of the warranty to the address designated by Airco, during normal business hours, transportation charges prepaid; and (z) upon examination by Airco, the part or component must be found not to comply with the above warranty. Return trip transportation charges for the part or component shall be paid by Purchaser. In the event that Airco elects to refund the purchase price, the apparatus shall be the property of Airco and shall be promptly shipped to Airco at Airco's expense. This Mechanical Warranty shall be void and the apparatus shall be deemed to be purchased AS IS in the event that the entire purchase price has not been paid within thirty (30) days of original shipment of the apparatus.

THERE ARE NO EXPRESS OR IMPLIED WARRANTIES THAT EXTEND BEYOND THE WARRANTY HEREINABOVE SET FORTH. THERE IS NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE APPARATUS OR ANY PART OR COMPONENT THEREOF AND NO WARRANTY SHALL BE IMPLIED BY LAW.

Items not of Airco's manufacture but resold by Airco are the products of other manufacturers and their warranty, if any, shall apply. THERE ARE NO WARRANTIES OF ANY KIND ON PRODUCTS OF OTHER MANUFACTURERS RESOLD BY AIRCO, EXCEPT THE WARRANTY OF TITLE, AND NO WARRANTIES SHALL BE IMPLIED BY LAW. THERE IS NO EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO PRODUCTS OF OTHER MANUFACTURERS.

PERFORMANCE WARRANTY: Airco warrants that the apparatus will comply with the specifications set forth in the purchase order. All specifications are subject to the corrections and tolerances allowed by the NEC. If the purchase order expressly provides for factory testing to verify compliance with the specifications, the Purchaser shall be entitled to witness the testing and the results of the testing. Upon demonstration of compliance with the specifications by factory testing, Airco's liability for failure to comply with the specifications shall t... purchase order does not describe... for demonstration of compliance... test program (which may incorpo... results based upon similarity of... hall be used for such purpose.

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If the purchase order does not expressly provide for factory testing, compliance with the specifications shall be demonstrated by field testing which shall be conducted by Purchaser at Purchaser's expense. Airco shall have the right to: (a) witness the field testing and to verify the results of such field testing; (b) have free access to all data compiled by the Purchaser in connection with any field test; and (c) conduct its own field test at its own expense during any 14-day consecutive period which may be mutually agreed upon by Airco and the Purchaser; provided, however, that Airco shall have the right to field test within six months of receipt from the Purchaser of any notice of failure to comply with the specifications. If compliance with the specifications is to be demonstrated by field testing, the Purchaser shall conduct and complete all field testing within sixty (60) days of the original shipment of the apparatus and shall promptly notify Airco of any failure to comply with the specifications. Airco shall not be liable for any failure to comply with the specifications demonstrated by field testing unless it receives notice thereof within sixty-seven (67) days of the date of original shipment of the apparatus.

In the event that factory testing or field testing does not demonstrate compliance with the specifications, the Purchaser's sole and exclusive remedy under the above warranty is limited to, at Airco's option, repair or replacement of defective parts or components or return to the Purchaser of the purchase price of the apparatus. In the event that Airco elects to refund the purchase price, the apparatus shall be the property of Airco.

Any obligations on Airco's part under this Performance Warranty are subject to the following requirements: (x) the nature of the failure of the apparatus to comply with the specifications must be promptly reported to Airco in writing; (y) if the apparatus has been delivered and field tested, the Purchaser must return the apparatus or any part or component to Airco upon its request, not later than sixty-seven (67) days after initial shipment to Purchaser, to the address designated by Airco, during normal business hours, transportation charges prepaid; and (z) upon examination and testing by Airco, the apparatus must be found not to comply with the specifications. Return trip transportation charges for the apparatus or any part or component shall be paid by the Purchaser. This Performance Warranty shall be void and the apparatus shall be deemed to be purchased AS IS in the event that the entire purchase price has not been paid within thirty (30) days of original shipment of the apparatus.

THERE ARE NO EXPRESS OR IMPLIED WARRANTIES THAT EXTEND BEYOND THE WARRANTY HEREINABOVE SET FORTH. THERE IS NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE APPARATUS OR ANY PART OR COMPONENT THEREOF AND NO WARRANTY SHALL BE IMPLIED BY LAW.

DISCLAIMER OF LIABILITY: IN NO EVENT SHALL AIRCO BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, ARISING FROM ANY SOURCE such as, but not limited to, the manufacture, use, delivery (including late delivery) or transportation of any apparatus, part or component sold to Purchaser, whether such damages are caused by Airco's negligence or otherwise. Without limiting the generality of the foregoing sentence, Airco shall not be liable for: the cost of capital; the cost of substitute apparatus, services, repairs, components or parts; loss of profit or revenue; the cost of power whether purchased or produced by the consumer thereof; loss of use of the apparatus or any part thereof, or any other property owned by Purchaser; claims or costs of Purchaser's customers; injury to persons or death; or damages to any property. In the event that any limited warranty or disclaimer of liability is found to be unlawful or inapplicable, or to have failed of its essential purpose, Airco's liability shall be limited to the amount paid by Purchaser for the apparatus.

AIRCO Temescal 2850 Seventh St., Berkeley, CA 94710 • Telephone 415/841-5720, TWX 910-366-7366